

# NAVAL MEDICAL RESEARCH AND DEVELOPMENT NEWS

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## Harry Hoogstraal Room Established at AFPMB, Forest Glen Annex

The Harry Hoogstraal Room in the Armed Forces Pest Management Board (AFPMB) offices at Fort Detrick's Forest Glen Annex, Silver Spring, Md., is dedicated to the life work and memory of Dr. Harry Hoogstraal, 1917-1986. Hoogstraal was considered the world's leading authority on ticks and tickborne illness. He authored over 500 scientific publications, compiled an eight-volume research catalog on ticks and tickborne diseases, and was awarded 23 honorary degrees, medals, special research citations and honorary lectureships for his work.

He was born in Chicago, Ill., February 24, 1917, and died in Cairo, Egypt, on his 69th birthday. His career was wide-ranging and extraordinary. During World War II, he was assigned to the U.S. Army 19th Medical General Laboratory near Hollandia, Dutch New Guinea, where he engaged in a massive taxonomic study on mosquitoes. After the war, he took his discharge in

Manila and under the auspices of the Field Museum organized a major biological expedition into the interior of the Philippine Islands of Mindanao and Palawan, spending the next two years exploring and collecting on those islands. From 1948 to 1949 he served in the University of California African Expedition and late in 1949 joined the staff of the U.S. Naval Medical Research Unit No. 3 (NAMRU-3) in Cairo, Egypt. For 35 years he was the director of NAMRU-3's Department of Medical Zoology. At NAMRU-3, Dr. Hoogstraal was an SES, having been appointed on July 13, 1979 as a charter member of the Senior Executive Service. He was president-elect of the American Society of Tropical Medicine and Hygiene at the time of his death.

His personal library and specimen collection, now housed with the U.S. National Tick Collection at Georgia Southern University in Statesboro, Ga., comprises some 200,000 items, including tick specimens, field notes,

(Continued on page 8)



*The Harry Hoogstraal Room in the Armed Forces Pest Management Board offices at Fort Detrick's Forest Glen Annex is dedicated to the life work and memory of Dr. Harry Hoogstraal (1917-1986), B.S. 1938, M.S. 1942, University of Illinois; Ph.D. 1959, D.Sc. 1971, London School of Hygiene and Tropical Medicine; D.(h.c.) 1978, Ain Shams University; D.Sc.(hon.) 1983, University of Khartoum; Captain, U.S. Army, Pacific Combat Theater, 1942-1946; Head, Medical Zoology Department, NAMRU-3, Cairo, Egypt, 1949-1986. "The greatest authority on ticks and tickborne diseases who ever lived" and "GOD" without peer.*



*Naval Medical Research Unit No. 3 staff circa 1950. Dr. Hoogstraal is second from the left in the first row.*

### In this issue...

<a href="#">CO's Message</a>	2
<a href="#">Junior Officer of the Year</a>	2
<a href="#">World Malaria Day</a>	3
<a href="#">Spatial Disorientation Solutions</a>	4
<a href="#">Society of Toxicology Meeting</a>	5
<a href="#">New NMRC Buildings</a>	6
<a href="#">TRAC Conference</a>	7
<a href="#">Ombudsman's Note</a>	8
<a href="#">NMRC ID Seminar</a>	9



## Commanding Officer's Message

The Naval Medical Research Center and its seven subordinate laboratories (NHRC-DET NAMRL will close and become part of NAMRU-Dayton in FY11) collectively form a research, development, testing and evaluation enterprise that is the Navy's and Marine Corps' premier biomedical, dental research and biosurveillance organization with over 1500 dedicated professional, technical and support personnel focused on force health protection and enhancing deployment readiness of DoD personnel worldwide.

These laboratories conduct formal Program 6 research from basic investigative studies through applied research, advanced development and on to testing and evaluation. They also conduct non-program 6 evaluative studies such as infectious disease surveillance and response and public health capacity building in the developing world. NMRC enterprise projects fall within 15 product lines: Aerospace Medicine, Biological Defense, Combat Casualty Care, Dental and Biomedical Research, Directed Energy Bioeffects, Epidemiology and Behavioral Sciences, Environmental Health, Infectious Diseases, Marrow Donor Program, Medical Modeling and Simulation, Operational and Undersea Medicine, Tropical Medicine, Undersea Medicine and Warfighter Performance. All projects address at least one of the Surgeon General's five Navy Medicine Research, Development, Testing and Evaluation Research Priorities, and Program 6 projects also address an identified Joint Force Health Protection Gap.

The diverse capabilities and geographical distribution of these laboratories reflect the broad mission and vision of the NMRC enterprise. For example, on any given day researchers at the OCONUS labs may be working with host national government collaborators to assess the threat of emerging infectious diseases. CONUS lab researchers may be evaluating methods to mitigate the effects of stressful physiological or psychological environments on human health and performance. Our work, though clearly operationally focused, is held in highest esteem by the U.S. and international scientific community. Hundreds of presentations and publications are submitted and accepted each year, and work is frequently featured in the world's leading peer-reviewed scientific journals and at international conferences.

Commanding Officer sends,  
Richard L. Haberberger, Jr.  
CAPT, MSC, USN



## Bravo-Zulu to Lt. Cmdr. Gary Brice, NMRC's Junior Officer of the Year!

Lt. Cmdr. Gary Brice of Naval Medical Research Unit No. 2 (NAMRU-2) Pacific, Detachment Singapore, was selected as the 2010 NMRC Junior Officer of the Year. Brice was selected from a very competitive group of Navy Medicine Research and Development's most talented officers.

"Lt. Cmdr. Brice's selection as junior officer of the year highlights the quality of officers working in Navy Medicine Research and Development and the importance of sending the highest quality officers to our overseas activities. They are the face of the Navy and Navy Medicine to the rest of the world. NAMRU-2 is successful in Southeast Asia because of officers like Gary Brice," said NAMRU-2 Commanding Officer, Capt. Gail Hathaway.

Brice is NAMRU-2 Pacific's repre-

(Continued on page 5)



From left to right: Capt. Bruce Gillingham, U.S. Ambassador to Laos Mrs. Karen Stuart, Rear Adm. Mittleman, Capt. Hathaway, Lt. Col. James McAden, Lt Cmdr. Gary Brice, Master Sgt. Christopher Kohunsky.



## NMRC Observes World Malaria Day with Guest Speaker, Posters

As part of the joint Walter Reed Army Institute of Research (WRAIR) and Naval Medical Research Center (NMRC) Distinguished Speakers Seminar Series, NMRC hosted Dr. Christopher Plowe, a well-known malariologist, to discuss the possibility of eradicating malaria. Plowe is Professor of Medicine, of Microbiology and Immunology, and of Epidemiology and Preventive Medicine at the University of Maryland School of Medicine. He is Chief of the Malaria Section of the University's Center for Vaccine Development.

Speaking to a packed audience in the Behnke Auditorium, April 21, Plowe provided a one-hour overview of the historic and present global efforts to control the spread of malaria and also focused on the research efforts underway at the University of Maryland.

He noted that there has been a slight decline over the last year in deaths related to malaria, but the numbers are still high, averaging about 100 deaths every 60 minutes.

"At the Center for Vaccine



NMRC hosted Dr. Christopher Plowe, a well known malariologist, from the University of Maryland School of Medicine. Photos by Louis Sanders.

Development in Baltimore, we study the impact of genetic diversity on malaria drug and vaccine efficacy using high-throughput genotyping and mathematical modeling. We work with scientists in Africa, Asia and South

America to train junior scientists and build research capacity in malaria-endemic countries," Plowe said.

Addressing the theme of his presentation, "Can Malaria be Eradicated," he said, "Yes, with an end to poverty and strife and with new and better tools that can work within these situations. It probably won't happen in my lifetime, and not without a highly efficacious vaccine. New talent, ideas, tools and resources will be needed for the decades to come."

Following Plowe's comments, a poster presentation highlighted the most recent Navy and Army progress in the development of malaria vaccines, drugs against malaria, and entomologic control of malaria. Twenty-nine posters were set up around the auditorium and represented work by researchers from WRAIR and NMRC. NMRC provided 15 posters for review and discussion.

Jointly, the Navy and Army are working to develop vaccines to protect military forces against the debilitating infectious disease.

After the event, Capt. Thomas



Dr. Christopher Plowe talks with Deana Parris, a sophomore in high school and a world-ranked trampolinist who is very interested in biochemistry and malaria.

(Continued on page 4)

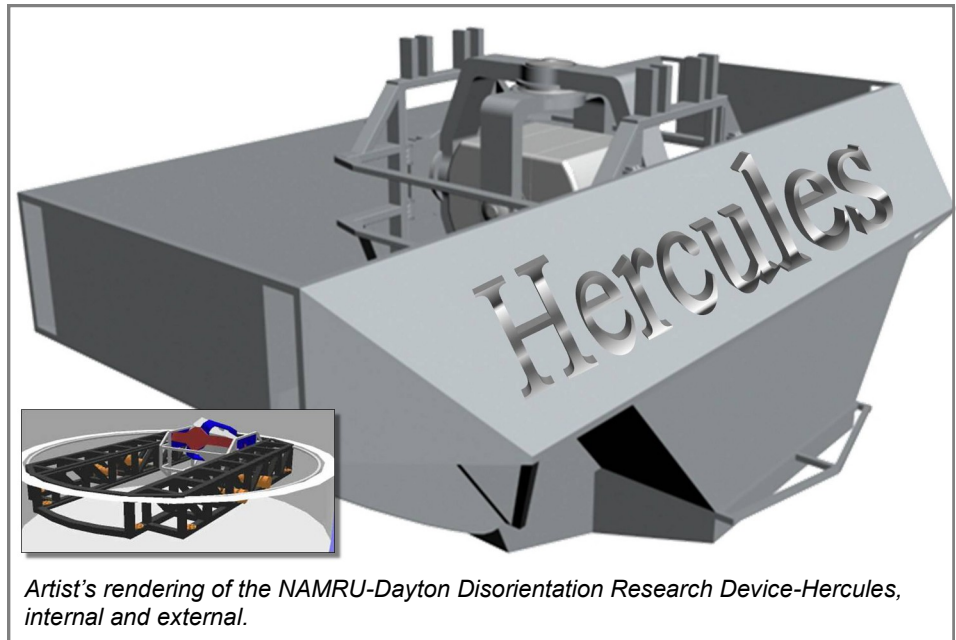
## NAMRL and NAMRU-Dayton Pursue Solutions to Spatial Disorientation

By Lt. Cmdr. Philip Fatolitis, NAMRL

As the Naval Aerospace Medical Research Laboratory (NAMRL) in Pensacola, Fla. completes the BRAC transition to the Naval Medical Research Unit-Dayton ([NAMRU-Dayton](#)) at Wright Patterson Air Force Base (WPAFB), the laboratory's spatial disorientation expertise will be applied to the "next generation" research utilizing new state-of-the-science research facilities and devices.

Future spatial disorientation research will be enhanced by the laboratory's newest acquisition, the Disorientation Research Device (DRD)-Hercules. This Navy one-of-a-kind device will become a cornerstone of research in the new Joint Center of Excellence for Aerospace Research, Training and Education at WPAFB. This device will help researchers address fleet aeromedical problems that include spatial disorientation, cockpit design, motion sickness and associated interventions, and visual and other sensory and acceleration issues.

The DRD-Hercules capabilities include the integration of a precisely controlled, dynamically changing acceleration environment providing six independent degrees of freedom with reconfigurable visual displays and data collection capabilities, including physiological monitoring and telemetry; simultaneous yaw, pitch and roll movement; sustained acceleration to 3g; and off-center rotation. The cockpit



Artist's rendering of the NAMRU-Dayton Disorientation Research Device-Hercules, internal and external.

part of the DRD-Hercules has a total of 32 cubic feet of payload space to accommodate physiologic monitoring equipment to support fatigue, respiratory and cardiovascular research in unusual acceleration environments. The payload space is large enough to mount reduced oxygen breathing devices (ROBD) and air tanks in order to support hypoxia research.

The unique cockpit design allows for man-in-the-loop mode in which the research subject who pilots the device controls movements within the capsule. These controls can be linked with a flight simulator so the research subject feels the forces experienced in an actual flight environment. The cockpit design can accommodate a single research subject centered in the

capsule or two research subjects side by side.

NAMRU-Dayton was activated October 6, 2010, during a ceremony at WPAFB as part of the 2005 Base Realignment and Closure (BRAC) actions for Navy Medicine. Two laboratories combined: NAMRL, relocating from Naval Air Station Pensacola, and the Environmental Health Effects Laboratory, located at WPAFB since 1976. NAMRU-Dayton conducts research in the areas of acceleration effects, aviation medical standards and personnel selection, physiological and cognitive effects of altitude, vision research, pulmonary health effects, neurotoxicology, neurobehavior, reproductive health and systems biology.

## NMRC Observes World Malaria Day with Guest Speaker, Posters

(Continued from page 3)

Richie, the Research Coordinator of the U.S. Military Malaria Vaccine Program, said, "A warfighter with malaria can be incapacitated for one to three weeks and some malaria infections can rapidly become life

threatening if not promptly diagnosed and treated. We have very effective drugs to treat individuals suffering from malaria, but the most cost-effective measure to fight this disease is to develop preventive malaria vaccines."

Approximately half of the world's population is at risk of malaria. Malaria

infects more than 243 million people every year. The burden is heaviest in sub-Saharan Africa but also afflicts Asia, Oceania, Latin America, the Middle East and even parts of Europe.

The first World Malaria Day was instituted by the World Health Assembly in May 2007.



## NAMRU-Dayton Participates at Society of Toxicology Meeting

By Lt. Pedro A. Ortiz, NAMRU-Dayton

The Society of Toxicology (SOT) 50th Annual Meeting was held in Washington, D.C. March 6-10. The annual meeting is the largest toxicology gathering and exhibition in the world and was attended by more than 7,500 scientists from academia, government and industry from around the globe.

The Environmental Health Effects Directorate of the Naval Medical Research Unit – Dayton ([NAMRU-Dayton](#)) participated in the meeting, where attendees had an opportunity to learn about emerging fields and relevant toxicological issues from the wide range of scientific lectures and posters. At SOT, NAMRU-Dayton had an exhibit booth that oriented meeting attendees to current research and capabilities, encouraged interaction with collaborators and sponsors and promoted scientific discussion. Overall, the meeting served as an excellent venue for NAMRU-Dayton to share current research and future directions aimed at enhancing the protection and performance of military personnel.

Dr. Karen Mumy presented research focusing on developing a series of cell-based screening methods to rapidly assess military fuels. This work, entitled “*In Vitro* Exposure and Evaluation of Military Fuels and Biofuels,” was presented in the Mechanistic Assessment of Chemical Mixtures session and highlighted two biofuels currently un-



NAMRU-Dayton Environmental Health Effects Directorate members in front of the NAMRU-Dayton exhibit booth at the Society of Toxicology Annual Meeting. From left to right: Lt. Pedro A. Ortiz, Dr. Karen L. Mumy, Dr. Andrew R. Osterburg, Dr. Michael L. Gargas, Dr. Brian A. Wong, and Dr. Lisa M. Sweeney.

dergoing testing. Hydro-treated renewable jet fuel made from camelina and biodiesel F-76 generated from algae were evaluated for their cytotoxic and mutagenic potential. It was determined both biofuels were less cytotoxic than their conventional fuel counterparts (JP -5 and F-76) and neither displayed evidence of mutagenicity.

This year's meeting focused on the following scientific themes: Emerging

Global Public Health Issues; Environment and Disease; Global Air Quality and Human Health; Integration of Toxicological and Epidemiological Evidence to Understand Human Risk; Novel Approaches to Preclinical Safety Assessment: Bridging the Gap Between Discovery and the Clinic Through Translational Toxicology; and Toxicity Testing: State of Science and Strategies to Improve Public Health.

## Bravo-Zulu to Lt. Cmdr. Gary Brice, NMRC's Junior Officer of the Year!

(Continued from page 2)

sentative in Singapore, where he established medical exchanges with the Singapore Armed Forces (SAF) and led a senior delegation from the SAF Force Medical Protection Command on visits to the U.S. Army Area Medical Laboratory, Army Medical Research Institute of Infectious Diseases, Navy Environmental Preventive Medicine Units 2 and 5, Armed Forces Health Surveillance Center, and the Naval Medical Research Center/Walter Reed Army Institute of Research.

Working with the Emerging Infectious Disease Program and Duke/National University of Singapore (Duke/NUS) Graduate Medical School, Brice established a regional pathogen discovery network with partner countries including Sri Lanka, Vietnam, Singapore, Malaysia, Laos and Cambodia. Building on these partnerships, Brice expanded the breadth of Navy research in Southeast Asia by conducting influenza surveillance in Singapore, evaluating mosquito control devices at U.S. and SAF training camps, initiating the first preclinical malaria

vaccine research studies in Singapore, and providing training and capacity building for respiratory disease surveillance in Laos.

Brice supports the U.S. Embassy Singapore's Office of Defense Cooperation (ODC), where he initiated Information Exchange Agreements and Research, Development, and Technology Evaluation Agreements with priority countries within the region. His efforts provide a direct impact to future engagements and force health protection for the joint warfighter operating within the area of responsibility.

## Hard Hat Tour of New NMRC Buildings at Ft. Detrick, Maryland

Recently a group from the Naval Medical Research Center ([NMRC](#)), Silver Spring, Md., took a “hard hat” tour of two new buildings going up at Ft. Detrick, an Army base in Frederick, Md. These new “green” buildings are part of the Base Realignment and Closure-directed moves.

One building is the two-story Joint Center for Excellence for Medical Research, Development and Acquisition that will include office spaces for 16 Navy Medicine personnel. This 22,200 square-foot building will be a collocated work space with the Chemical Biological Defense, Joint Project Manager for Chemical Biological Medical Systems (CBMS).

The second building is a two-story



*NMRC staff inspect the Navy Biomedical Research facility located on the National Interagency Biodefense Campus, Ft. Detrick. Dr. Al Mateczun (left), Director of NMRC Biological Defense Research Directorate, inspects progress of the construction and recent installation of new walk-in refrigerator.*



*A team from NMRC, NMSC and BRAC CNIC offices inspect the Joint Biomedical Research, Development and Acquisition Management Center at Ft. Detrick, Md., under construction. The facility will be a collocated function with the Chemical Biological Defense, Joint Project Manager for Chemical Biological Medical Systems (CBMS).*

laboratory that will house NMRC's Biological Defense Research Directorate (BDRD). Once completed, BDRD's 36,660 square-foot biomedical research laboratory will be part of the National Interagency Biodefense Campus. The NMRC scientists will join research teams from the National Cancer Institute, the National Institute of Allergy and Infectious Diseases, the U.S. Department of Agriculture, the U.S. Department of Homeland Security, and the Centers for Disease Control and Prevention.

For nearly 15 years, BDRD has researched ways to protect military personnel in the event of a biological attack. The research team is considered a leader in the field of detection, which includes hand-held assays, molecular diagnostics and confirmatory analysis. More recently,

the team has made great strides in developing a new DNA-based vaccine to protect against anthrax.

BDRD serves as a national resource providing testing and analysis for the presence of anthrax and other potential biological hazards. Its portable laboratory, the only one of its kind developed to detect biological agents, was deployed to conduct tests at the Pentagon following the crash of American Airlines flight 77 on September 11, 2001. After the October 1, 2001 anthrax attacks, BDRD analyzed more than 16,000 samples from the Capitol. The team detected the presence of anthrax at the Hart Senate Office building, the Supreme Court and several area mail processing facilities.

The buildings are scheduled to be ready to move into in the fall.



## NAMRU-Dayton Plays Major Role in 2011 TRAC Conference

The 2011 Toxicology and Risk Assessment Conference (TRAC) was held in Cincinnati, Ohio April 25-28. This year's meeting brought together scientists across various branches of the government, including the Navy, Air Force, Army, Environmental Protection Agency (EPA), National Institute for Occupational Safety and Health (NIOSH), Agency for Toxic Substances and Disease Registry (ATSDR) and the Food and Drug Administration (FDA), in addition to non-profit groups and universities. The conference focused on new hazards and methodologies in risk assessment and concentrated on homeland security issues, reproductive and developmental toxicology in the military, new ordnance compounds, open burning, nanomaterials, and utilizing cellular-based methods for exposure assessment and evaluating unique compounds.

The Naval Medical Research Unit-Dayton ([NAMRU-Dayton](#)) Environmental Health Effects Directorate actively participated in the meeting by organizing, chairing



*Dr. Wayman Cheatham, director, Navy Medicine Research and Development Center at the Navy Bureau of Medicine and Surgery, and Dr. Michael Gargas, director, Environmental Health Effects Directorate, NAMRU-Dayton, conferring prior to the Reproductive and Developmental Toxicology session.*

and presenting in a variety of sessions. Cmdr. Dan Hardt presented a health risk assessment of military burn pit emissions in a

session that focused on open burning, co-chaired by Lt. Pedro Ortiz. Dr. Karen Mumy coordinated a separate session that focused on the development of alternative exposure and toxicological methods, in which she also spoke regarding the use of cellular models to evaluate military fuels. Dr. Palur Gunasekar co-chaired a session focused on toxicity evaluation of new ordnance compounds.

One of the highlights of the meeting was the session entitled "Reproductive and Developmental Toxicology: Relevance to the Armed Forces," which paid particular attention to the unique materials to which the men and women of our Armed Forces may be exposed. This session was organized and chaired by Dr. Michael Gargas, director of NAMRU-Dayton's Environmental Health Effects Directorate and was co-chaired by Dr. Wayman Cheatham, special assistant to the Surgeon General of the Navy for Medical Research and director of the Navy Medicine Research and

*(Continued on page 9)*



*Members of NAMRU-Dayton Environmental Health Effects Directorate with Dr. Wayman Cheatham of the Navy Bureau of Medicine and Surgery at the 2011 Toxicology and Risk Assessment Conference. Left to right: Dr. Karen Mumy, Lt. Pedro Ortiz, Dr. Cheatham, Dr. Michael Gargas, Dr. Lisa Sweeney, Dr. Andrew Osterburg, and Cmdr. Dan Hardt.*

## Harry Hoogstraal Room Established at AFPMB, Forest Glen Annex

(Continued from page 1)

manuscripts and original drawings of ticks and other memorabilia.

Today, NAMRU-3 conducts infectious disease research and surveillance in the Middle East, Southwest Asia, Africa and Eastern Europe. Current studies focus on influenza-like illness, acute febrile illness, diarrheal disease, hemorrhagic fever, HIV, meningitis and infection control.

The AFPMB, originally chartered in 1956, meets twice a year in Washington, D.C. to discuss vectorborne disease and pest management topics of interest to the Department of Defense. The AFPMB is a Directorate in the Office of the Deputy Under Secretary of Defense for Installations and Environment.



*Photographs and certificates depicting the career of Dr. Harry Hoogstraal in the Harry Hoogstraal Room at the Armed Forces Pest Management Board.*

## Greetings from the NMRC Ombudsman!

**Military Spouse Appreciation Day:** The Navy celebrates Military Spouse Appreciation Day on May 6th. Showing appreciation for the ultimate unsung heroes, the Navy honors spouses for their support and stability in maintaining resiliency and mission readiness. Spouses "hold it down at home," allowing Sailors to focus on the mission while deployed. We salute spouses, the patriots that serve out of uniform, for managing frequent relocations, family separations and holidays alone; for changing jobs; overcoming language and cultural barriers; and assuming the role of both mother and father.

Every time you thank a service member serving our country, extend that same "thank you" to the SPOUSE that STANDS next to him or her.

**Celebrating Military Children:** April and May have been designated as a time to celebrate our military children. This observance recognizes the sacrifices and celebrates the youngest family members that also serve. Raising happy, well-adjusted and well-educated children is the mission of every parent. Being heard, cared for and loved are the single most effective strategies used in reducing some of the challenges faced by military children. Acknowledge the stressors children may experience such as frequent relocation or having a deployed parent. Talk about what it means to be a military family and why military families are special. Encourage your children's interests and celebrate their individuality. While there is no substitute for a deployed parent, as a community let us participate in supporting and strengthening our Navy families.

Some great resources and programs for children and youth include Operation: Military Kids, Let's Move, Talk Kit for Military Families, Tutor.com, and SitterCity. If you would like to know more about any of these or other programs, please contact me.

**Consider Volunteerism:** Did you know that 73 percent of employers would recruit a candidate with volunteering experience over one without; children with parents that volunteer are 80-90 percent more likely to volunteer as adults; and students who volunteer receive higher grades and are less likely to drop out of school? Develop new skills, interact with a new social network and even improve your health. Those facts aside, volunteering just feels good!

Contact your local Fleet and Family Support Center or programs in your community to find out about potential opportunities.

If you need more information on these or any other resources, please contact me at [angela.prouty@med.navy.mil](mailto:angela.prouty@med.navy.mil) or 217-722-4981.

Angela Prouty  
Ombudsman, NMRC



## NMRC Infectious Diseases Seminar Series Features Dr. Frédéric Poly

On April 15, the Naval Medical Research Center (NMRC) Infectious Diseases Directorate seminar series hosted Dr. Frédéric Poly from the NMRC Enteric Diseases Department. Poly addressed a well-attended audience in the Behnke auditorium and discussed his research on the development of a multiplex polymerase chain reaction (PCR) to determine *Campylobacter jejuni* capsule types. *Campylobacter jejuni* is a major cause of bacterial diarrhea in developing countries, where its incidence is several orders of magnitude higher than that in developed countries. These endemic regions represent a major health concern for deployed military troops.

To overcome this burden, a prototype monovalent capsule conjugate vaccine was developed by NMRC's Enteric Diseases Department that showed 100 percent efficacy against diarrhea in a study performed at the Naval Medical

Research Unit No. 6 (NAMRU-6) in Lima, Peru, using a laboratory disease model.

Unfortunately, since *C. jejuni* has the ability to produce many different types of capsules, an estimation of valency required for an effective capsule-conjugate vaccine against *C. jejuni* is needed. It has been demonstrated that the *C. jejuni* capsule is the major heat stable determinant of Penner serotyping scheme, a system that includes 47 serotypes. Due to its complexity, Penner serotyping is performed in only a few labs worldwide, so Dr. Poly, in conjunction with Dr. Patricia Guerry of NMRC, developed a multiplex PCR method for the determination of capsule types of *C. jejuni*.

Multiplex PCR primers were based on a database of genes from the variable capsule loci of 10 published sequences and 8 strains sequenced at NMRC. The multiplex



Dr. Frédéric Poly.

PCR can distinguish between 17 individual serotypes in two PCR reactions with sensitivities and specificities ranging from 90-100 percent. The multiplex PCR typing system is currently being used in multiple sites worldwide, including the Armed Forces Research Institute of Medical Sciences and NAMRU-6.

## NAMRU-Dayton Plays Major Role in 2011 TRAC Conference

(Continued from page 7)

Development Center at the Navy Bureau of Medicine and Surgery. During the session, Dr. Lisa Sweeney discussed how physiologically based

pharmacokinetic models can be used to evaluate reproductive and development toxicants and Dr. Michael Gargas spoke on the subject of assessing the reproductive and developmental risks associated with submarine atmospheres. Overall,

2011 TRAC was an excellent platform for NAMRU-Dayton to highlight its current and future research paths and network with toxicologists from other branches of the government in an ongoing effort to protect military personnel.

### NMR&D News

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